Science Mission Directorate
National Aeronautics and Space Administration

AIRS DATA FOR REGIONAL FORECASTING AT THE SPORT CENTER

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Huntsville, Alabama

AIRS Science Team Meeting – March 2007

transitioning unique NASA data and research technologies to the NWS

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NASA's Short-term Prediction and Research Transition (SPoRT) Center

Mission: Apply NASA measurement systems and unique Earth science research to improve the accuracy of short-term (0-24 hr) weather prediction at the regional and local scale (http://weather.msfc.nasa.gov/sport/)

Transition research capabilities / products to operations – particularly NWS Forecast Offices (WFOs) and other private sector data users

- **MODIS imagery and products**
- **AMSR-E products**
- **Short-term forecasts from WRF (nudged with EOS data)**
- ***AIRS profiles and derived products***

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Keys to Success

Agency level: plan strategic objectives

- commitment to activity at all levels of both organizations

Local / user: match data to end user needs

- link data / products to forecast problems

Problem ⇔ Data ➡ Solutions

- develop/demonstrate solutions in test-bed mode
- integrate capabilities into operational decision support systems and verify / validate performance
- develop / conduct training
- user feedback / interaction
- benchmark products and applications

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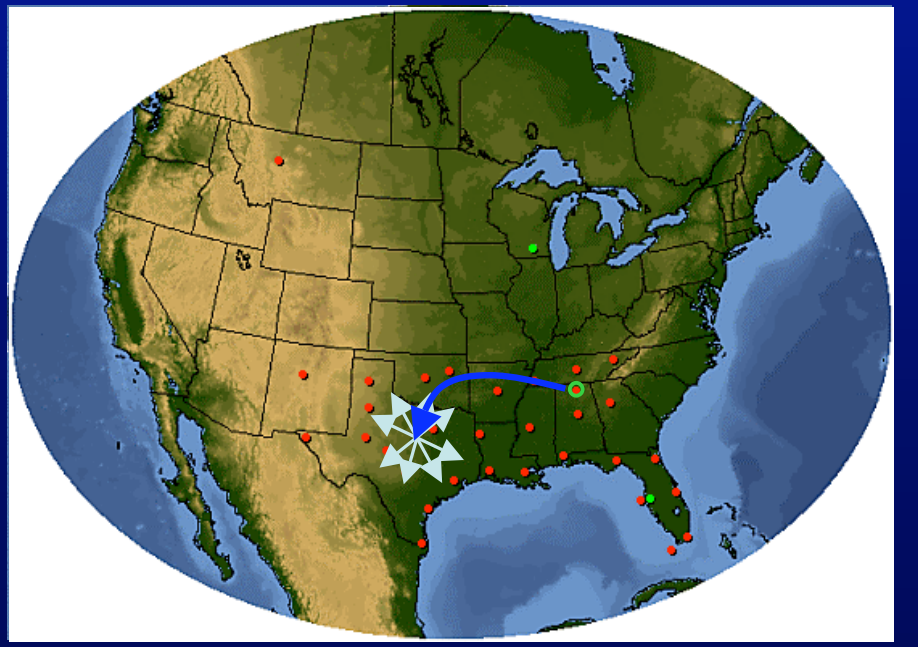
Interactions with WFOs

Real-time MODIS and AMSR-E (L1B and L2 products) from University of Wisconsin (UW) and University of South Florida (USF) and AIRS L1B data from UW

Process, reformat, and create additional value added products

Disseminate to (6 WFOs) for inclusion in the AWIPS data streams

Plan: For broader dissemination, send data and products to NWS Southern Region (SR) headquarters for broader dissemination via LDM



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AIRS Data to WFOs

Forecast issues at WFOs addressed by AIRS:

- atmospheric destabilization leading to *convective storms and severe weather*
- *fog and low cloud detection at night*
- *diagnoses of 4D moisture variability at the mesoscale, particularly upstream of developing weather situations*
- *Improved 0-24 prediction of sensible weather elements*

How can AIRS help?

- access to real-time data -- selected product imagery and profiles
- provide improved initial conditions and / or forecasts through data assimilation

Need to educate user community on interpretation and use of AIRS data and products

- don't saturate them with information
- customize products to environment

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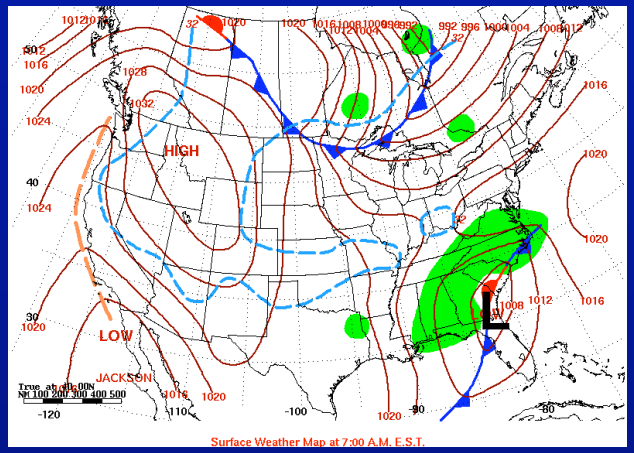
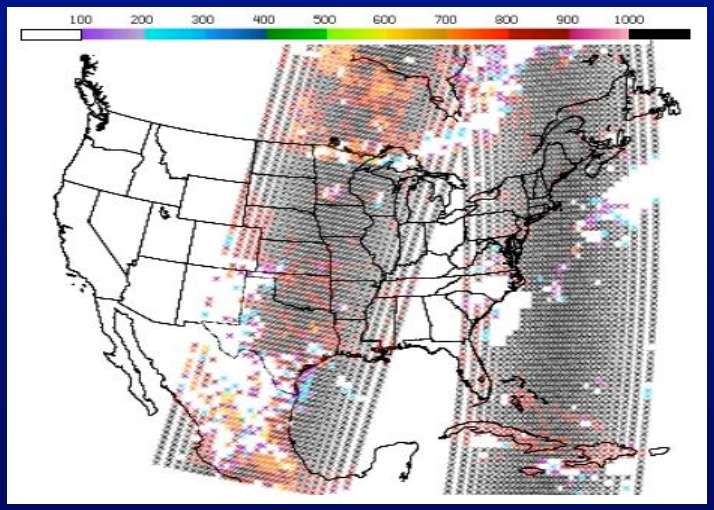
What is SPoRT Doing?

AIRS data assimilation into WRF for improved short-term forecasts

- develop profile assimilation capabilities and near real-time demonstration
- techniques to assimilate radiances into GSI / WRF at JCSDA





Provide model forecasts to selected WFOs for evaluation and assessment

- impact and use
- develop transitional strategy

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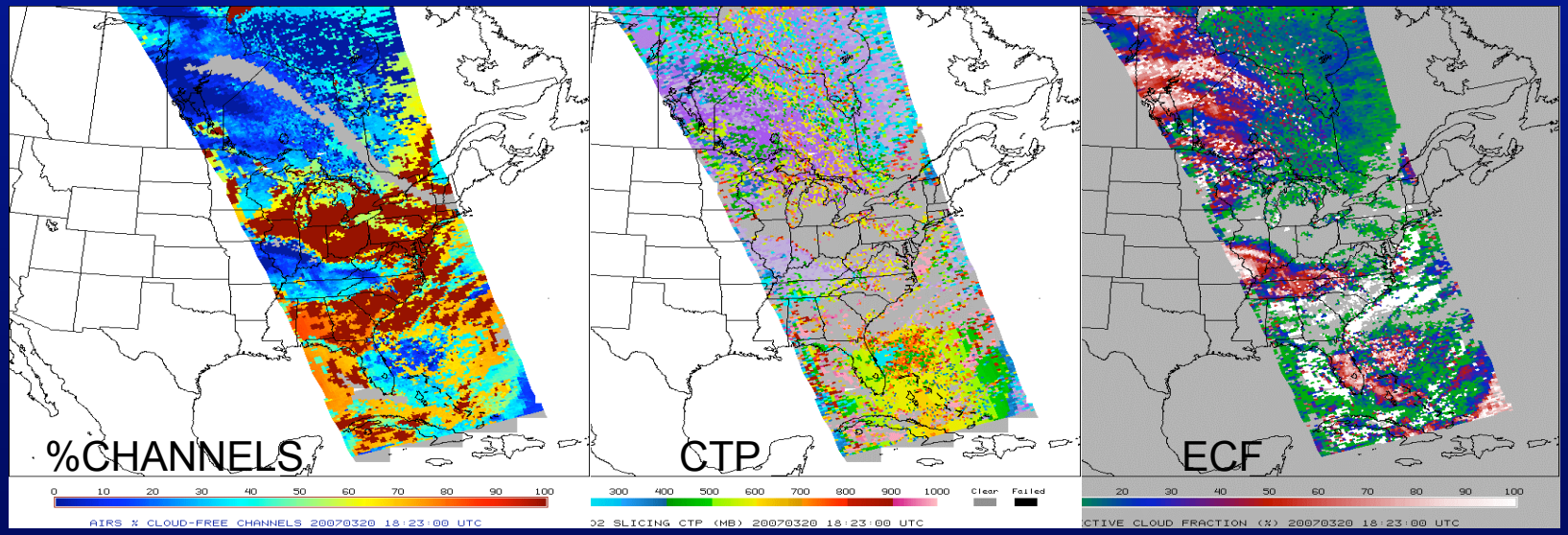
What is SPoRT Doing?

Real-time AIRS image products to selected WFOs

- cloud top pressure (CTP)
- effective cloud fraction (ECF)
- others – TBD

Sounding products – asynoptic profiles of temperature and moisture



http://weatther.msfc.nasa.gov/sport "AIRS Imagery and Products"

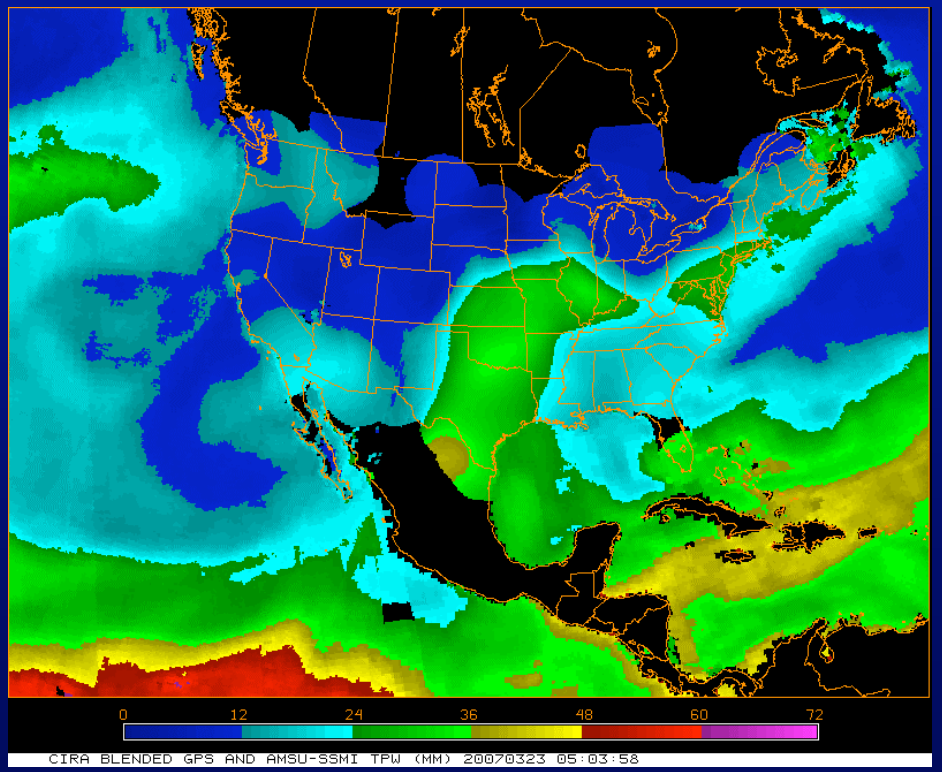
Opportunities!

Real-time product generation at direct broadcast sites for access by the community

- collaborator algorithms / products link to real-time data
- disseminate to selected WFOs

Better definition of the

- 3D structure of moisture
- atmospheric stability
- fill void in conventional observations
- asynoptic gap filler



Blended GPS/AMSU/SSMI TPW